CONTRIBUTION OF VALUE MANAGEMENT TO QUANTITY SURVEYING PROFESSION IN GAUTENG, SOUTH AFRICA

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ABSTRACT

PURPOSE
This study examines the contribution of value management to Quantity Surveying (QS) profession in the quest to fulfilling clients' requirements of achieving value for money and return on investment whilst optimizing project function.

DESIGN
Primary data were collected through well-structured questionnaires administered on quantity surveyors using purposive sampling method. Mean Item Score (MIS) and Standard Deviation (SD) were used to analyse data to evaluate the order of importance of identified variables.

FINDINGS
VM has not been fully accepted and utilized in QS profession majorly due to lack of VM study team leaders, insufficient support from construction industry to implement VM and lack of sufficient finances to fund VM workshops. VM will benefit QS services of providing value for money for construction clients by increasing functionality and quality of projects at the lowest possible overall cost.

VALUE
This study provides necessary information on the awareness, usefulness and benefits of VM to promote the discipline among QS. This will benefit QS, QS firms and construction industry at large in their quest to improve delivery and performance of construction projects.

KEYWORDS
Construction project performance, project function, Quantity surveying, Value for money, Value management.

1 INTRODUCTION

The main objective of stakeholders for construction projects, that is, clients, contractors, consultants and other statutory bodies, is to achieve value for money by minimizing costs to maximize profits where applicable. Because of continuous complexity of construction activities and involvement of different project stakeholders, value for money requirement by clients have become a very challenging undertaking for the construction professionals.

The inefficiency of a proper framework to manage and address all the key requirements of the project is a major challenge to the successful delivery of construction projects. The concept of value management was developed because of the clients' desire to obtain value for money, and to meet the challenges posed by the changing social, economic, political, and technological environment needs[1].

Value management is defined as a systematic approach for enhancing client's project to develop common ideas of the project objectives or design problem and the solutions of such problems that is normally carried out during the early stages of the project[2].

It is an organized approach to reduce or maximize project costs and increase functionality while maintaining or improving performance and quality standards[3]. It is not just concerned about cost saving or cutting but the emphasis is on achieving value and function of projects and their parts at the lowest possible overall cost.

The management and reduction of construction costs has always been a predominant role of quantity surveyors. For consultant quantity surveyors, their main objective is to save client's money and ensure that the money is efficiently used throughout the project lifecycle[4].

With these clients' requirements and expectations, it remains the consultant quantity

surveyors' duty to ensure that every client's value related needs are efficiently fulfilled. It is very key for consultant quantity surveyors to adopt value management in their services, this is to be able to provide a valuable and satisfying service to their clients [5], as well as to be competitive in the market/industry.

Integrating value management within the quantity surveying profession can be an asset to the construction industry reputation from the professionals' perspectives as well as in meeting the value requirements of project owners [5]. The quantity surveyors' use of value management in clients' construction projects will bring about various considerable benefits within the entire construction project lifecycle.

This study therefore examined the contribution of value management to quantity surveying profession to achieve value for money for construction projects which is the major objective of construction projects stakeholders.

2. LITERATURE REVIEW

2.1 HISTORY AND ROLES OF QUANTITY SURVEYORS

The history of quantity surveying can be traced to ancient Egyptian who had specialized personnel to carry out construction costs and estimates for their construction purposes. It attained its dominance in the construction market in the 17th century on the restoration and rehabilitation of London after the Great fire. In 1836, the profession entered its new age when the new House of Parliament of Great Britain, designed by Sir Charles Barry, became the first major public contract to be fully measured and tendered using detailed bills of quantities for financial accountability [6]. Quantity Surveyors were recognized or referred to as measurers, custom surveyors or surveyors.

Their purpose was to measure the construction works before, during and after completion of building projects while frequently submitting interim and final accounts to the building owner [7]. In the early days, once the Architect was done with the building designs and specifications, they will be distributed among Master Builders to submit tenders for that project. Every contractor who was willing to tender for a job had to prepare and compile his own bills of quantities for every project.

However, it came to their realization that it would be cost efficient and ease the tendering procedure to employ one surveyor to measure, prepare and compile a bill of quantities for them all. Through the years, quantity surveying has gained its recognition and has expanded its roles and existence to other industries such as mining, energy, property, oil and gas exploration etc. Quantity surveyors are recognized and categorized according to field of work and job description [8].

Quantity surveyors are usually employed by organizations involved in the infrastructural activities, these employers include quantity surveying firms, construction companies and property developers. Occasionally, quantity surveyors are also employed by public or private entities that their organization activities require the use of structures to become project managers to oversee the project and manage other professionals involved in the project.

Quantity surveyors working in consultant firms are retained by the construction clients to ensure that what is eventually built by the contractor is according to clients' design and specification and within the clients' budget [8]. The responsibilities of the client's quantity surveyor include the preparation of Bills of Quantities, production of contract documents and the giving of advice pertaining to cost and legal issues arising from the contract. They work alongside the designers (architects and engineers), contractors, suppliers, and project owners to meet the requirements of the project as well as reduce risks which may contribute towards the project failure [7].

Quantity surveyors employed by construction companies deal with construction financial aspects such as costing and estimating on behalf of the contractor during the pre-tender stage of the project to arrive at a probable bid price. To achieve this, they work along subcontractors, suppliers and contract managers. During the construction stage, the contractors' quantity surveyors does the site cost controlling, scheduling and quantifying materials to be used on site, measuring and agreeing of the construction works done on site with the client's quantity surveyor as well as the analysis and preparation of variation orders, processing claims and generating interim valuations.

The main role of the quantity surveyor in this regard as opined by Royal institute of Chartered Surveyors [6], is to perform duties which are financial related in a perception of securing the contractor's investments or profits on construction projects and ensure that the

contractor gets paid the right amount of work carried out on site. Hence, quantity surveyors participate at all stages of the construction project lifecycle, from project conception and briefing to the project closeout [9]. The services of the quantity surveyor are unarguably of essence in the construction industry as they hand core activities in projects, thus, they ensure the fulfilment of the financial requirements and expectations for all the project stakeholders based on their employment.

2.2. VALUE MANAGEMENT IN CONSTRUCTION

Achieving value for money in construction projects is an imperative goal of every project, and this is beyond mere proper and efficient management of the project and delivering a project to time, cost and quality. Value for money in construction has expanded to a wider spectrum. This entails the contribution of the project to the environment (project location), delivering a range of multiple social and economic benefits and the flexibility of the project to suit future uses [10]. Value management is a systematic approach to reduce the cost of the project under study through focusing on aspects such as technical solutions, drawings, specifications etc. and it can also be applied to projects which already exists[7].

The use of value management during the early project stages provides an exceptional opportunity to explore a project's objectives and aspirations from the client's perspective as well as other project stakeholders. The value management technique's key question, that is, what functions are required of a component(s) and how can the same function be performed at the same or lower cost, enables value management to be applied and utilized in a variety of fields, including construction, although the process originated in the manufacturing industry. The applicability of value management varies according to the project stage [5]. Irrespective of the type of field in which value management is being utilized, the earlier this technique can be adopted in a project, the greater the probabilities of achieving a greater project value [11].
However, there are certain factors which hinder or prohibit acceptance of value management by construction stakeholders including quantity surveyors. These include lack of awareness of value management, misconceptions, denial to change and innovation, and the stereotypical opinion of clients and the construction industry in general[12].

2.3 VALUE MANAGEMENT AND QUANTITY SURVEYING PROFESSION

The demand for value management is steadily rising in the construction industry as the industry has always been faced with continuous challenges resulting in clients' dissatisfaction. Moreover, clients are also concerned with the outcomes from their investments in terms of capital expenditure on the project [13]. The expectation of the project operational and functional aspects also forms major project objectives in terms of project performance and the end-user comfort.

With the increasing challenges facing the construction industry in terms of the project delivery, value management has been adopted and utilized in many countries. Realizing the fact of raised demand and expectations in project delivery, value management has been adopted in the construction industry in many countries as a vital tool in achieving project goals as well as accommodating the varying requirements of various stakeholders i.e. engineers, quantity surveyors, contractor etc. [14].

The quantity surveyor's aspirations on integrating value management within their scope of work during the early project status will facilitate and promote the use of value management in construction projects [1]. The quantity surveyors' distinctive competence in terms of the service they provide in the construction industry lies within their ability to apply their skills and knowledge to utilize an analytical approach to projects with an attempt to measure and articulate the comprehensive financial aspects relating to the project under study[9].

The skills and knowledge of quantity surveyors as well as their scope of work qualifies them to be regarded as the potential candidates in great position to implement the application of value management in the construction industry[9]. Value management is identified as a natural progression of the Quantity Surveying profession due to their leading role in construction projects, as well as the quantity surveyor's expert knowledge and skills pertaining to construction financial and legal affairs[15].

Furthermore, a successful value management workshop requires the quantity surveyor's full participation to carry out the costing and estimating of the evaluation of various components of the project under study [4]. They

estimate and analyse the project budget with an objective of developing potential alternatives which can reduce the project cost and provide value to the project proponent. Hence, it is for this attributes that the quantity surveyor is the ideal professional to lead the value management workshops in construction since they are usually appointed as the project principal agent to oversee and manage the project from inception till completion including the management of other professionals [9].

The continuous expansion in the roles of quantity surveyors has preserved the profession's survival over the years, as technology and other professionals tend to interfere and undertake quantity surveying roles [10]. Additionally, quantity surveying has ensured its survival and success through complying with the continuous professional development (CPD) [7]. Therefore, the integration of value management within quantity surveying core competency requirements in the professional registration bodies will facilitate the continuous professional development of the profession.

3. RESEARCH METHODOLOGY

Quantitative method was adopted for the study and a level of objectivity was maintained from the subject of the research. An in depth understanding of the existing literature in the field was ensured through reviewing of relevant literature materials in the study. This allowed for formulation of clear and vivid data collecting tool and effective analysis as well as interpretation of collected data. The results were then used to support and expand on the existing theories relating to value management and quantity surveying in construction. Questionnaires were administered on professional quantity surveyors both in consulting and contracting firms in Gauteng province, South Africa due to high economic activities in the province.

Potential respondents for the study are professional quantity surveyors practicing in Gauteng region of South Africa. Purposive sampling method was adopted by ensuring that the respondents are members of Association of South African Quantity Surveyors (ASAQS) in the study area and a total of 65 questionnaires were administered personally and through email. The instrument was communicated in English as all respondents in the sampled area communicate and carry out their business in English language. The respondents were assured of anonymity of their responses through a cover letter indicating the purpose of the study. Each questionnaire took an average of fifteen minutes to complete. After completion, some of the completed questionnaires were emailed while the rest were personally retrieved, a total of 41 were retrieved and certified fit for further analysis. A 5-point Likert scale was adopted and transformed to mean item score (MIS) for each of the factors and the indices were used to determine the rank and importance of each variable.

The MIS was calculated for each item as follows:

$$MIS = \frac{1n1 + 2n2 + 3n3 + 4n4 + 5n5}{\sum N} \quad \text{..... Equation 1.0}$$

Where: n1 = Number of respondents for extremely unlikely or strongly disagree
n2 = Number of respondents for unlikely or disagree
n3 = Number of respondents for average or neutral
n4 = Number of respondents for likely or agree
n5 = Number of respondents for extremely likely or strongly agree
N = Total number of respondents

4. FINDINGS AND DISCUSSION

4.1 DEMOGRAPHIC INFORMATION OF RESPONDENTS

For respondents' gender, about two-third are male while the remaining are female.

They are spread across various age groups with more than 50% between 26 and 35 years with an average of about 9 years working experience.

The results also indicate that 53.7% of the respondents are Black, 26.8% are White, 7.3% are Coloured and 12.2% are either Indian or Asian.

4.2 CONTRIBUTION OF VM TO QS SERVICES

Quantity surveyors have been linked to the discipline of value management in the construction industry right from its inception and it has contributed immensely to the improvement of their services.

4.3 HINDRANCES TO ADOPTION OF VM IN QS PROFESSION

There are numerous number of factors hindering the adoption of VM in Quantity Surveying profession. The basic ones as revealed in table 1 are lack of VM study team leaders, inappropriate timing for applying VM during project cycle, VM workshop facilitating disputes among project

Table 1: Challenges to acceptance of value management

Challenges	σ.X		R
Lack of VM study team leaders	8.109	4.73	1
Inappropriate timing for applying VM during project cycle	6.436	4.32	2
The VM workshops facilitates disputes among project stakeholders	6.453	4.24	3
Insufficient support from the industry to implement VM	0.863	4.17	4
Lack of emphasis on VM during the early project stage	0.872	3.88	5
Lack of creditable VM education and training	0.843	3.80	6
Management's reluctance to implement VM	0.822	3.78	7
Design team are against VM because of the probable redesig ns	1.067	3.63	8
Insufficient skills and expertise of the VM team to execute VM study	1.002	3.54	9
Unavailability of sufficient finances to fund VM workshops	0.850	3.32	10
VM is a mere cost reduction tool	1.078	3.29	11
Allocated duration for VM study is too short	0.936	3.22	12
Engineers/Architects already does VM	0.889	3.10	13
VM is a bureaucratic tool	0.905	3.07	14
There's no time for conducting VM study	1.005	2.88	15
VM complicates the early stages of the project	1.135	2.76	16
VM is time consuming	1.078	2.71	17

σX = Standard deviation; = Mean item score; R = Rank

stakeholders and insufficient support from the industry to implement VM.

Other barriers are lack of emphasis on VM during the early project stage, believe that design team already does VM and perceiving VM as a bureaucratic tool.

The least important factors are that there is no time for conducting VM, VM complicates the early stages of the project and VM is time consuming.
As indicated in table 2, VM significantly improve the following QS services: cost planning and control, budget estimating, project planning and development and feasibility study.

It will also ensure that services such as schematic design, adjudication of submitted bids, method statement and preparation of final account are rendered with optimum efficience

4.4 BENEFITS OF VM TO QS PROFESSION

Value management will not only improve the services of quantity surveyors but will also impact positively on the construction industry. Table 3 revealed the major benefits which include encouragement of innovative solutions, identification and removal of unnecessary cost, mitigation of schedule overruns, improvement of efficiency during construction as well as defining the end-user requirements and satisfaction. It will also enhance decrease in variation orders, provide balance among project stakeholder's varying interests, improve construction productivity due to simplified designs, simplify construction drawings and reduce common project conflicts and risks.

4.5 DISCUSSION OF FINDINGS

Despite the importance and great benefits associated with application of VM around the world, it was observed that there are still some barriers to its full adoption and utilisation in the study area. The major reasons can be summarized as wrong perception due to inadequate knowledge and proper awareness of the discipline. In agreement, studies have shown that latter application of value management in a construction project compromises its potential benefits [1][16]. Similarly, value management was not listed as one of the required competencies by quantity surveyors for Assessment Professional Competencies (APC) for professional registration by Royal Institution of Chartered Surveyors [17].

Except for project closeout with a mean value of less than 3.00, value management will aid effective delivery of QS services if fully utilized and implemented. Achieving value for money invested

Table 2: Impact of value management on QS services

Quantity Surveying services	σ.X		R
Cost planning	6.065	4.65	1
Cost controlling	6.293	4.47	2
Budget estimating	0.733	4.37	3
Project planning and development	0.650	4.32	4
Feasibility study	0.767	4.24	5
Project brief	0.714	4.12	6
Construction stage	1.012	4.02	7
Preliminary desi gn	0.927	3.88	8
Scope statement	0.882	3.85	9
Tendering	0.892	3.83	10
Selection of specifications and methodologies	0.954	3.80	11
Schematic design	1.019	3.76	12
Adjudication of submitted bids	0.879	3.68	13
Method statement	0.942	3.63	14
Final account	1.759	3.61	15
Project closeout	1.233	2.93	16

σX = Standard deviation; = Mean item score; R = Rank

in the project is a major benefit of applying VM to construction projects [12] [18]. More so, life-cycle costing was indicated as one of the areas where value management can be applied in a typical construction project [5].

Also, value management does not only achieve better value, but also deliver significant benefits such as better communication between the project stakeholders and ensuring a better understanding of project objectives by all participants [19].

5. CONCLUSION AND RECOMMENDATION

This study has contributed to the body of knowledge by highlighting various challenges to the adoption of value management for construction projects. Quantity surveying professional services that will benefit from the adoption of value management study were evaluated while the general benefits of the study to construction projects were also examined. The factors hindering the acceptance and utilization of value management in the Quantity Surveying profession are arising from the industry's negligence to implement value management as well as lack of awareness and knowledge of the discipline. The benefits of the use of value management in the Quantity Surveying profession is mainly to harmonize various project components, to ensure value for money for clients and enhance that project are delivered to the best function at the lowest possible overall life cycle cost. Value management will impact Quantity Surveying profession generally but especially at the conception and early stage of project construction before practical completion.

It is therefore important for quantity surveyors and quantity surveying firms to shoulder, support and promote the use of value management as a technique for achieving better performance of construction projects.

There is a need for training and retraining of fresh and experienced quantity surveyors on the practical application of value management study and such can be achieved through professional conferences, workshops, conferences, etc. on the concept of value, value management and value management workshop.

Awareness of the potential benefits of the discipline should also be created among construction clients, sponsors, financiers, government agencies and other stakeholders of construction projects. This will help to promote

Table 3: Benefits of value management

Benefits	σ.X		R
Encourages innovative solutions	11.086	4.76	1
Identifies and removes unnecessary costs	7.944	4.54	2
Mitigates schedule overruns	8.059	4.05	3
Improves efficiency during construction	6.292	3.90	4
Defines the end -user requirements and satisfaction	0.762	3.34	5
Maximizes the project value	1.011	3.32	6
Minimizes the maintenance cost once the final product is in use	0.725	3.22	7
Improves operational efficiency	0.679	3.20	8
Outlines and maximize long -term business needs	0.654	3.15	9
Maximizes savings on client's capital	0.727	3.15	10
Improves the project's quality standards	0.735	3.10	11
Provides a clear definition of the client's expectations	0.735	3.10	11
Reduces wastage during construction	0.850	3.02	13
Enhances the selection of environment -friendly materials and methodologies	0.880	3.02	13
Mitigates cost overruns	1.129	3.02	15
Enhances the skills of the participants	0.755	2.93	16
Enhances network and communication between project stakeholders	0.889	2.90	17
Decreases variation orders	1.046	2.83	18
Provides a balance among project stakeholder's varying interests	0.756	2.68	19
Improves construction productivity due to simplified designs	1.115	2.61	20
Simplifies construction designs/drawings	1.002	2.54	21
Reduces conflicts and risks	1.075	2.49	22

σX = Standard deviation = Mean item score; R = Rank

the adoption of the practice for construction projects and this will not only ensure value for money for construction clients but will also enhance better return on investment.

6. REFERENCES

[1] Green, S.D. (2007) "Beyond value engineering: smart value management for building projects", International Journal of Project Management, 12(1), 49-56.

[2] Kelly, J. (2007) "Making client values explicit in value management workshops", Construction Management and Economics, 25(4), 435-42

[3] Chen, W.T., Chang, P. & Huang, Y., (2010) "Assessing the overall performance of value engineering workshops for construction projects", International Journal of Project Management, vol. 25(8), 514-527.

[4] Matipa, W.M., Kelliher, D. & Keane, M. (2008) "How a quantity surveyor can ease cost management at the design stage using a building product model", Construction Innovation, 8(3), 164 – 181.

[5] Bowen, P., Edwards, P., Cattell, K. & Jay, I. (2010) "The awareness and practice of value management by South African consulting engineers: Preliminary research survey findings", International Journal of Project Management, 28(3), 285-295.

[6] Royal Institute of Chartered Surveyors (2005) "Interim valuations and payment http://www.rics.org, [Accessed on the 17th of August 2015].

[7] Ochieng Wao, J. & Flood, I., (2014) "Quantity Surveying and Value Engineering in Construction Projects: A survey of Quantity Surveyors", International Journal of Project Management, 21(7), 356-375.

[8] Said, C.P., Moore, C.D., Engell, A.D., Todorov, A., & Haxby, J.V., (2010) "Distributed representations of dynamic facial expressions in the superior temporal sulcus". Journal of Vision, 10, 6-10

[9] Bowen, K., Cattell, P. & Edwards, I.J (2009) "Value management practice by South African quantity surveyors", Facilities, 28(½), 46-63.

[10] National Audit Office (2001) "Getting value for money from construction projects through design", National Audit Office, London.

[11] Royal Institution of Chartered Surveyors (2000) "RICS draft guidance note – Value engineering and value management, http://consultations.rics.org/, [Accessed on the 20th of August 2015].

[12] Oke, A. E, Aghimien, D. O. and Olatunji, S. O. (2015) "Implementation of value management as an economic sustainability tool for building construction in Nigeria", International Journal of Managing Value and Supply Chains, 6(4), 55-64.

[13] Kelly, J., Male, S., Graham, D. (2004) "Value Management of Construction Projects". Blackwell Science, Oxford.

[14] Devine-Wright, H., Thomson, D. and Austin, S. (2004) "Matching values and value in construction and design", Loughborough University, Loughborough.

[15] Oke, A. E. and Ogunsemi, D. R. (2013) "Areas of competencies of quantity surveyors and their relevance to value management discipline". In Innovative and Sustainable Management of Building and Infrastructure Projects, Ibrahim, A. D., Adogbo, K. J. and Ibrahim, Y. M (eds.), The Nigerian Institute of Quantity Surveyors, Nigeria, 359 - 368.

[16] Aghimien, D. O. and Oke, A. E. (2015). Application of value management to selected construction projects in Nigeria, Developing Country Studies, 5(17), 8-14.

[17] Royal Institution of Chartered Surveyors (1992) "The Core Skills and Knowledge Base of the Quantity Surveyor". RICS Research Paper No. 19, Royal Institution of Chartered Surveyors, London.

[18] Atabay, S. & Galipogullari, N. (2013) "Application of Value Engineering in Construction Projects", Traffic and Transportation Engineering, 1(1), 39-48.

[19] Male, S., Kelly, J., Gronqvist, M. & Graham, D. (2007) "Managing value as a management style for projects", International Journal of Project Management, 25(2),107-114.